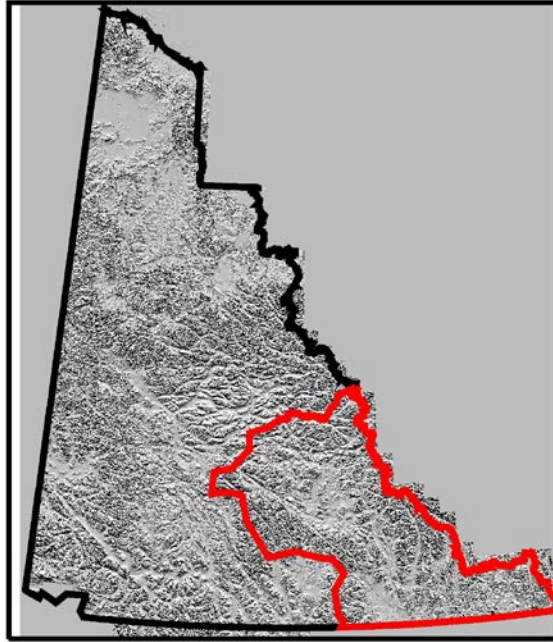


# Kaska Forest Resources Stewardship Council



## Regional Forest Management Plan Framework

**“A community-based approach for ecosystem-based  
forest management planning”**

Prepared by:  
Norm MacLean  
Independent Chair  
Kaska Forest Resources Stewardship Council

## EXECUTIVE SUMMARY

This report describes how the Kaska Forest Resources Stewardship Council will complete ecosystem-based forest management planning at the regional and subregional levels.

The Council is responsible to develop a regional forest management plan for the Kaska traditional territory in southeast Yukon, and develop two subregional plans for the Little Rancheria Woodland Caribou Herd and the Garden Creek area. The plans must include Kaska Land Stewards-Traditional Knowledge, community values and interests, and be open to the public. The decision-making must be transparent and information used to develop the plans will be available to the public.

For the regional plan, ecological, cultural, social and economic goals will be set for landscapes that need to be maintained over time. Those goals will be based on Kaska Land Stewards, plan communities, and the public providing direction to the KFRSC. The KFRSC will then assess if those goals can be maintained and then provide the information to the public for review. Through this interactive process, an informed and balanced regional forest management plan will be completed.

To develop the regional plan, a number of tools will be used such as planning across scales, values and measures for economic, cultural, and ecological values, ecological benchmarks, focal species, zoning, and management practices.

The process in developing the regional plan is the KFRSC will provide draft zoning and management options for public review. The KFRSC will also direct that technical analysis occur to provide information for public review of the trade-offs for the range of values in a landscape. This process will occur twice and includes community, local government, and public interest groups' participation. The direction from the communities and the public will then be the basis for developing one management option. The draft management option will then be provided for up to a sixty-day public review. After that, a draft regional plan will be presented to the Kaska First Nations and the Yukon Government for approval. As an outcome of the regional plan, a recommended Annual Allowable Cut (AAC) will be developed based on the plan by the Yukon Government.

The difference with this type of planning compared to previous timber supply analysis or forest market analysis is what drives the outcomes. In traditional timber planning, a harvest level was set and then planning occurred to maintain that level and minimize impacts to ecological, social, and cultural values and interests. It often led to problems because the planning was maintaining an

economic goal based on a number of economic assumptions not relevant to the ecological landscape.

By identifying all values and interests on the landscape and treating them equally, can lead to identifying relevant goals for a landscape that are informed, balanced, and tailored to community needs (e.g. sustainable forestry with high community benefits).

Another key element of the planning is having informed recommendation-making occurring in an open and transparent manner. To that extent, the KFRSC has a history of meeting with plan communities, public interest groups, and governments and providing support for the collection and implementation of Kaska Traditional Knowledge for all the plans. Finally, all material used by the KFRSC in developing recommendations or planning have been available to the public.

Subregional planning will occur in a similar fashion but will be at a finer scale but will have the same methods and transparency.

As mentioned above, the Kaska Forest Resources Stewardship Council has developed draft zoning and draft management options for public review and the technical analysis described in the report has begun. The planning framework is based on defining the plan area into planning units, and within each planning unit, there are several landscape units. This has been done based primarily on broad ecological zoning and major watershed boundaries within the plan area. There are five planning units within the plan area.

The zoning is based on assessing the economic, cultural, ecological, and social values and determining the trade-offs from forest development activities. Management direction is being developed that identifies goals, management objectives, strategies, practices, and targets. Draft management options have been identified for each of the planning units and landscape units. For each planning and landscape unit, draft management options will be analysed and provided for public review.

The following are the draft zones, management direction, and management options being considered for the plan area:

#### Zones

- Deferred – permanent –The area is recommended for permanent removal from the Timber Harvesting Land Base (THLB).
- Deferred – temporary –Further information is required to consider forestry activities for the zone. The area is recommended for temporary removal from the Timber Harvesting Land Base (THLB).

- Area Specific Management – Management goals, objectives, and practices will identify integrated forest management activities specific to an area and is a component of the THLB.
- General Forest Management – Management goals, objectives, and practices for integrated forest management activities and is a component of the THLB.

General Forest Management Practices

General forest management practices will be adopted for all the above zones. Other resource sector development and planning should consider general management practices that will apply throughout the plan area.

Management goals, objectives, strategies, targets, and best management practices will be developed for the following components:

- |                             |                                   |                            |
|-----------------------------|-----------------------------------|----------------------------|
| • Biodiversity              | • Wildlife/Terrestrial Ecosystems | • Access                   |
| • Wetlands                  | • Fish/Aquatic Ecosystems         | • Silvicultural Strategies |
| • Trappers/Guide Outfitters | • Kaska Cultural                  | • Agriculture              |
| • Recreation                | • Timber                          | • Climate Change           |
| • Tourism                   | • Energy                          |                            |
| • Lakes                     | • Minerals                        |                            |
| • Water Quality             |                                   |                            |

Plan Wide Area Specific Management

There are a number of key values that are represented throughout the planning area that require special attention. These key features include large river corridors, wetlands, lakes, and cultural values.

*Large River Corridors*

Within each corridor it is expected that areas will be identified for ecological, cultural, and social values that could be deferred or have specific management direction. Also within this zone will be a different set of seral targets aimed at specific forest stands (e.g. alluvial spruce) and overall retention requirements will be different from forest stands adjacent the zone.

The size of each corridor will be dependent on the floodplain characteristics, wildlife and fish habitats, river headwaters, ecosystem representation, Kaska cultural-traditional uses, and timber.

### *Wetlands and Lakes*

Wetlands have a large role in the boreal forest ecosystem and need to be managed across scales. In addition, wetlands have high cultural and social values that need to be managed at various scales. Lakes have similar values as wetlands and will be managed in a similar fashion.

Wetlands and lakes will be classified, zoning applied, and it is expected that wetland and lake values will fall in all the management zone categories.

### *Cultural Values*

Kaska values, such as traditional areas, trails, or sites occur throughout the plan area and across scales. Kaska values and areas will be identified across scales and zoning, management direction and practices will be developed. It is expected that cultural values will fall in all the management zone categories.

### Management Options

Each Plan Unit was reviewed for values and interests at a broad scale, and a number of management scenarios considered for each Landscape Unit. For each Landscape Unit, further detailed planning will occur using ecosystem-based planning principles and will evaluate the degree of trade offs associated with each management option. The planning results, proposed management practices, and recognized trade-offs will be brought back to the communities and public to review.

### East Planning Unit

#### Deferred Areas

Upper Beaver and Labiche Landscape Units

#### Area Specific Management or Deferral

Smith River and Toobally Lakes Landscape Units

#### General Forest Management, Area Specific Management, or Deferral

Beaver Landscape Unit

Beaver Labiche Landscape Unit

## Central Planning Unit -

### Deferred Areas

Hyland Landscape and North Coal (northern portion) Landscape Units

### Area Specific Management or Deferral

Coal SMA and North Coal (southern portion) Landscape Units

### General Forest Management or Area Specific Management

Hyland Coal and Lower Coal Landscape Units

## West Plan Unit

### Deferred Areas

Upper Liard Basin  
Shared areas with Teslin Tlingit Council

### Area Specific Management or Deferral

Rancheria Landscape Unit

### General Forest Management or Area Specific Management

Lower Liard Basin, Lower Liard Wetlands, and Watson Lake Landscape Units

## Frances Lake Plan Unit

The whole area is considered deferred with only small volume timber permits (<1000 cubic meters) being allowed for building logs or timber for cabins. It is expected logging to use small openings and visual quality to be managed by Yukon Forest Management Branch.

Management direction for this plan unit will need to identify and set practices for access, wildlife, aquatic ecosystems, Kaska values, heritage areas, and mineral development.

## North Plan Unit

The Kaska Forest Resources Stewardship Council recognizes that the scale of forestry activities in this plan unit will be small, localized, and will be taking advantage of specific needs (e.g. building logs, timber for mines). The planning for the unit will have communities identify areas to avoid due to cultural, ecological or community values. Then as timber opportunities arise, Yukon Forest Management Branch working with the northern plan communities can place operators outside of these areas.

Some salvage operations may occur due to the number of fires in the area, possible timber from construction of mining roads, and community interest in small-scale bioenergy technologies

Management direction for this plan unit will need to identify and set practices for access, wildlife, salmon/aquatic ecosystems, Kaska values, heritage areas, and mineral development.

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## Introduction

### **Purpose**

This report describes how the Kaska Forest Stewardship Council will complete Regional and Subregional Forest Management Plans including:

- What the plans will provide
- The stages of the planning process
- The vision, principles, and goals to be used for planning
- How communities, public, and interested parties can be involved
- What are the key components for the plans
- What are the decision support tools that will be used to assist in developing plans

The KFRSC is applying an integrated resource management approach such that other resource potential, dispositions, or concessions are being considered in addition to the ecological, cultural, social, and economic values related to forestry activities.

Given this is the first joint First Nation – Yukon regional planning process in the southeast Yukon, it is expected that the identified values on the land, zoning approaches, and management direction will be used to assist in evaluating other land use activities in the plan area.

The plans are being developed to have a minor review and updates at 5 years, and a major update (reviewed and assessed for effectiveness) at 10 years.

### **Background**

On July 29, 2002, the Government of Canada, the Kaska First Nations, and the Government of Yukon undertook a memorandum of understanding (MOU<sup>1</sup>) on forest stewardship in the Kaska traditional territory. The agreement provided for the governments to establish the Kaska Forest Resources Stewardship Council and provided a mandate to implement regional forest management planning for the southeast Yukon. The MOU also allows for the council to provide regional guidance on recommendations identified by George Tough in his report, *Yukon Forestry Issues: A Reality Check and a New Direction*<sup>2</sup>, (commissioned by the Minister of Indian Affairs and Northern Development, Robert D. Nault and released on May 1, 2002).

As of February 2003, the Kaska Forest Resources Stewardship Council (KFRSC) began its duties for forest management planning in the Kaska traditional territory in

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<sup>1</sup> see [www.kfrsc.ca](http://www.kfrsc.ca)

<sup>2</sup> see [http://www.ainc-inac.gc.ca/nr/prs/m-a2002/for\\_e.html](http://www.ainc-inac.gc.ca/nr/prs/m-a2002/for_e.html)

SE Yukon. Its main role is providing consensus recommendations to the Kaska and Yukon governments regarding ecosystem-based forest resource planning (regional and sub-regional plans), policy, legislation, tenures and other aspects to forest management.

It is a body composed of three Kaska representatives and three Yukon representatives with an independent chairperson. The consensus recommendations are made only by the Kaska and Yukon representatives and only after public and community review and input have been considered. Currently the Kaska Forest Resources Stewardship Council members include:

John Devries  
Yukon

Norm Sterriah  
Ross River Dena Council

Bill Lux  
Kaska Dena Council

Jayne Sun-Comeau  
Liard First Nation

Dan Reams  
Yukon

Myles Thorp  
Yukon Government

Norm MacLean  
Independent Chairperson

Specifically, the KFRSC is required to complete the following by March 2006 (see Section 6.0 of MOU and August 2005 extension letter):

- *The Council will direct Forest Resources management planning and policy development through a cooperative and coordinated relationship between Canada, Yukon and the Kaska.*
- *Subject to the terms of this Agreement, the Council:*
  - (a) *shall direct and co-ordinate the development of an ecosystem-based regional Forest Resources Management Plans;*
  - (b) *shall direct and co-ordinate the development of sub-regional Forest Resources Management Plans;*
  - (c) *shall, following the conclusion of an Economic Benefits Agreement, direct and co-ordinate the development of an interim wood supply plan to meet interim commercial needs;*
  - (d) *in fulfilling its duties and responsibilities under 6.7(a), (b) and (c), shall direct and co-ordinate the preparation of Timber Supply Analyses and recommend Annual Allowable Cuts;*

- (e) shall review, and where appropriate, incorporate the recommendations and/or guidelines of other resource initiatives, including but not limited to fish and wildlife plans or initiatives, "Species at Risk" legislation or polices and wilderness tourism plans;
  - (f) shall be responsible for the development of recommendations regarding forest tenure policy;
  - (g) may make recommendations regarding the allocation and use of Forest Resources;
  - (h) may make recommendations regarding proposed Forest Resources legislation, policy, programs and research, and any other aspect of Forest Resource planning, management and policy development as required.
  - (i) shall seek input from the Kaska Traditional Land Stewards in the development of Forest Resources Management Plans and related policies;
  - (j) may make recommendations regarding:
    - (i) measures in response to large-scale natural disturbances;
    - (ii) timber harvesting methods;
    - (iii) silvicultural options;
    - (iv) access development and management; and
    - (v) monitoring of forest operations;
  - (k) shall provide opportunities for public and stakeholder input and shall consider such input in the development of Forest Resource Management Plans and significant policy recommendations;
- The Yukon, Canada and the Kaska shall make best efforts to provide in-kind human support and technical information to the Council as required to develop appropriate plans and policies. Technical information includes, but is not limited to, forest resource inventory data, Timber Supply Analysis, existing policies, research reports and plans, and other data, summaries, and reports that are relevant to Forest Resource planning and management.
  - The Kaska shall be responsible for identifying the Kaska Traditional Land Stewards referred to in 6.7(i).

To be able to complete planning by March 31, 2006, Council will provide draft regional and subregional plans by early February 2006 followed by a forty-five-day

review period. Draft plans would be updated with public comments and a final plan submitted to the Parties of the MOU.

The Technical Working Group has been established for the completion of specific technical tasks. The group has technical personnel from the Kaska, Yukon Government, and Federal Agencies to provide “in kind” support to the KFRSC. The group is directed by the KFRSC, and is expected to abide by the spirit and intent of the MOU and associated Terms of References.

The current members include:

Norm MacLean, Chair  
Norm Sterriah, KFRSC Traditional Knowledge Coordinator  
Myles Thorp, Yukon Forest Management Branch  
Lyle Dinn, Yukon Forest Management Branch  
Ken Kiemele, Yukon Department of Environment  
Jan Adamczewski, Yukon Department of Environment  
Norm Barichello, Kaska Technical Advisor  
Brian Ladue, Kaska GIS Analyst  
Kirk Price, Yukon Forest Management Branch  
Scott Heron, Canadian Wildlife Service  
Bruce Mclean, Yukon Department of Environment

## **Regional Forest Management Plan Role and Outcomes**

A Regional Forest Management Plan will provide direction on where forestry activities should occur in the Kaska traditional territory in the southeast Yukon and will recommend a suite of forestry practices to apply on the land.

The KFRSC, through Kaska, community, and public input, will:

- Assess the existing forest conditions
- Identify the ecological, cultural, social, and economic goals to be maintained over time
- Identify areas for forest development and deferral
- Provide direction on the desired future forest conditions, and the management practices and actions to achieve them over the plan’s life

This will all be done using ecosystem-based planning principles. The KFRSC will seek direction from communities and the public on the ecological, economic, social, and cultural values and consider the risks and benefits for a range of forest management options. Finally, the plan will identify the monitoring and implementation components that will be used to assess the effectiveness of the plan and apply an adaptive management process to update the plan over time.

The KFRSC will recommend the final draft Regional Forest Management Plan and Subregional Forest Management Plans to the Kaska First Nations and Yukon Government for review and approval.

Once approved, the Yukon Government and the Kaska First Nations will implement the plan. Currently the Kaska First Nations and the Yukon Government have agreed that the Southeast Yukon Forest Management Committee will have those duties. It is a Kaska and Yukon Government committee tasked under the 2004 Forestry Agreement in Principle to be the body, until a final agreement is completed, that implements forestry activities in the southeast. The Agreement in Principle identifies the economic partnership and business relationship for forestry in the plan area<sup>3</sup>.

### **Regional Plan Process and Main Phases**

- I. Planning Agreement and Plan Terms of Reference – MOU and Council's Terms of Reference have been completed
- II. KFRSC Vision and Principles – Council agreed to its Vision and Principles in 2003
- III. Ecosystem-based Management Guiding Principles for Regional and Subregional Plans – Council agreed to the definition and principles in 2004
- IV. Defining the Plan Area and Planning Units – Draft units were completed in 2003, and were approved in early 2004.
- V. Information Collection and Assessment – This will occur throughout the planning process. Existing information (including Kaska Traditional Knowledge) is being collected on the ecological, economic, social, and cultural values for the plan area. All of the values will be used to provide an assessment of the current forest condition through:
  - Broad scale ecological techniques that identify and provide representative seral stages, ecological benchmarks, forest patch size, and natural disturbance patterns based on their natural range.
  - Fine scale ecological techniques that identify and provide for specific species (focal species), and special elements (e.g. rare plant communities, hot springs, mineral licks)
  - Economic techniques that identify existing merchantable timber stands, and stands capable of becoming merchantable over time

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<sup>3</sup> see <http://www.gov.yk.ca/news/2004/04-068.html>

- Economic techniques that identify the current and potential resource use other than forestry in the plan area (includes agriculture, mining, oil and gas, trapping, guide outfitting and tourism)
- Cultural techniques that identify at the broad and fine scale Kaska values including traditional areas, trails, sites, and traditional family areas
- Social techniques that identify the current and potential community and recreation forest use
- Techniques that will assess the degree of overlap between the values and provide information to be considered for integrated management practices and zoning.

Community and public review will occur for input on existing information and provide direction on an initial draft set of zones and management options for the plan area.

- VI. Trade Offs and Options Analysis- Based on community and public input, a range of management options will be assessed for each plan unit. These options will be assessed for ecological, cultural, economic, and social trade offs and then brought back to the communities and public for further review.
- VII. Recommended Option – The KFRSC will consider the information provided on the options analysis and recommend a draft final management option for public review. Council will also present information on tenures, forest policy, and Allowable Annual Cut (AAC), consistent with the MOU, to the Kaska and Yukon Governments for review and consideration.
- VIII. Final Plan – The KFRSC will incorporate comments from the review and provide a recommended Regional Forest Management Plan to the Kaska and Yukon Governments for approval.
- IX. Implementation - Once a final approval has occurred by the Kaska and Yukon Governments, a number of implementation actions will need to commence. An obvious task will be to derive an Allowable Annual Cut (AAC) from the final accepted plan – for public lands this will be done by Yukon government. As mentioned earlier, the ability to make recommendations on the apportionment of the AAC to specific tenure types has been assigned to the Kaska-Yukon Southeast Yukon Forest Management Committee.
- X. Monitoring and Auditing – The KFRSC will seek community and public input as whether it should have a role in monitoring the regional plan and be an independent body for public concerns. This may include auditing to

provide a measure of the plan's effectiveness. Should this be the desired role, and it is acceptable to the public, the KFRSC will recommend that it assume this role to the Kaska and Yukon governments. In any event, the completion of the plan the Council will mark the end of Council's mandate as currently described under the existing MOU. Any further activities by Council will require a new mandate.

### ***Kaska Forest Resources Stewardship Council Vision and Principles***

The Kaska Forest Resources Stewardship Council's vision is to achieve the following through balanced forest management planning:

- Long term sustainable, integrated regional forest economy
- Kaska and Yukon residents benefiting from multiple values of the forest
- Community based integrated resource planning, consultation, and decision making process for regional forest management
- Fully functioning forest ecosystem over space and time that provides balanced environmental, economic, social and cultural benefits
- Using integrated information of traditional knowledge, science, and adaptive management practices to plan and implement forest management decisions

In order to meet the vision of the Kaska Forest Resources Stewardship Council, the following principles will be used to guide the Council in consensus forest management recommendations:

- Forest management plans and related policies shall be developed in accordance with the principles set out in the Canada Forest Accord and National Forest Strategy (2003-2008)
- Forest stewardship requires an integrated and balanced approach in planning management, policy and land tenure development
- Forest resource management must include remedial measures, monitoring, and public accountability
- Annual Allowable Cut determinations and timber supply analysis must be based upon Forest Management Plans developed by the Council
- Integrate traditional knowledge and experience of the Kaska people with that of the scientific community.
- Kaska traditional land use must be considered and best efforts must be made to protect Heritage sites

### **Plan Areas and Planning Units**

The area for the Regional Forest Management Plan is the Kaska Traditional Territory in the Yukon, an area of approximately 11 million hectares; it encompasses Forest Management Units Y01, Y02, Y03, and parts of Y04, Y08, Y09 and Y10.

The plan area has been broken into five plan units and within each plan unit, there are several landscape units. The plan units were developed using the national ecological classification at the ecoregion scale <sup>4</sup> and major watersheds.

Currently the plan units have been named on their geographic location in the plan area but it is hoped that communities and the public can provide Kaska or local names for the plan units (Map 1, Table 1). Landscape units have been named based primarily on the major watershed feature in the area (rivers or lakes) (Map2, Table1).

**Table 1. Area breakdown of plan and landscape Units**

Plan Unit	Landscape Unit	Area (ha)
Central	Coal SMA Zone	356,722
	Hyland	630,453
	Hyland Coal	425,907
	Lower Hyland	245,117
	North Coal	366,479
East	Beaver	141,780
	Beaver Labiche	648,570
	Labiche	301,860
	Smith River	142,297
	Toobally Lakes	61,520
Frances Lake	Frances Lake	969,826
North	East Trench	1,279,853
	North Plateau	984,265
	Selwyn Mountains	1,735,470
	West Trench	1,273,649
West	Liard Wetlands	102,983
	Liard Basin	555,198
	Lower Liard	583,683
	Rancheria	301,248
	Watson Lake	52,809

The Rancheria Subregional Plan is the Rancheria Landscape Unit, an area of approximately three hundred thousand hectares. The plan is located within Forest Management Unit Y03.

<sup>4</sup> see <http://sis.agr.gc.ca/cansis/nsdb/ecostrat/>



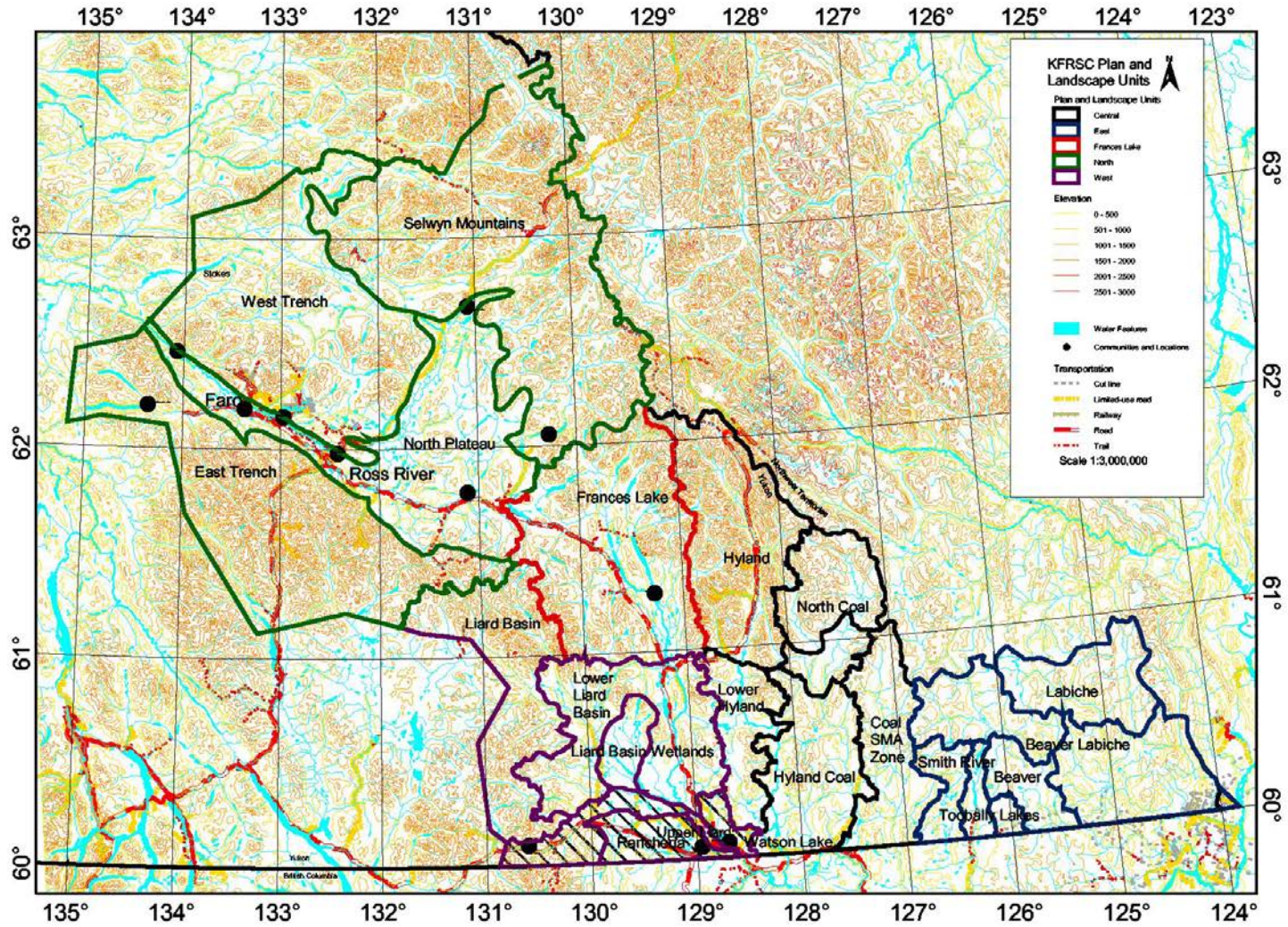


Figure 1. Plan and landscape units in the plan area

The Garden Creek Subregional Plan has not had its planning boundaries established but it should be available in the winter of 2005.

## **Ecosystem-based Principles, Goals, and Key Techniques**

### ***Definition***

A number of definitions have been developed for ecosystem-based management planning (EBM). Kaska Forest Resources Stewardship Council has reviewed several definitions and relied on several sources to develop the following definition<sup>5</sup>:

*Ecosystem-based forest management relies on an approach that maintains ecosystem function, structure, and composition and maintains suitable habitat conditions for all native species through space and time. This is achieved through:*

- *a system or network of deferred areas at the regional planning scale*
- *Maintaining a variety of habitats and ecosystems at the watershed and sub-watershed planning scale*
- *Maintaining important ecosystem attributes at the stand planning scale*

*To achieve this through planning requires the blending of social, cultural, and economic values with ecological values to provide long term community economic sustainability, community acceptable choices for the use of the forests, and maintaining long term ecological productivity.*

### ***EBM Guiding Principles***

Further to above, the following guiding principles for the forest management planning process will be considered to assist in meeting the Council's vision and principles<sup>6</sup>

- Maintain ecological integrity using an ecosystem-based approach that maintains forest health, structure, functions, composition and biodiversity, and considers:
  - Maintaining natural forested ecosystems
  - Maintaining ecosystem functions through a system of deferred areas

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<sup>5</sup> (Based on Implementation of Forest Ecosystem Management 1996, Forest Ecosystem Stewardship 1997, CPAWS Yukon - SE Yukon Conservation Atlas 2000 , and Coastal Information Team-Ecosystem-based Management Planning Handbook 2004)

<sup>6</sup> (modified from Canada Forest Accord & National Forest Strategy (2003-2008) and Coastal Information Team-Ecosystem-based Management Planning Handbook):

- Look to implement Kyoto measures related to managing forests to be a net carbon sink
- Conserving old forests and threatened forest ecosystems
- Integrated forest management planning with other interests (e.g. oil and gas, trapping, recreation, or guide outfitting)
- Recognize and accommodate First Nations Rights and Title, and interests
- Recognize and identify community economic opportunities that includes opportunities for skill development and job training; a diversified economic base; local benefits from resource development and extraction; and development that respects cultures and lifestyles.
- Provide plan communities, public, and interested parties opportunities and resources to participate and be well informed about forest management decision making. The plan process must be transparent and open by assessing risks and opportunities through community involvement to assess existing and future economic activities in the context of sustainable forest ecosystems.
- Recognize the associated uncertainty with existing information and management objectives. Management goals and objectives should be implemented with a degree of caution until information gaps have been addressed or the management objective has shown a proven history.

## ***Key Techniques***

### **Planning across scales**

#### *Ecological Framework and Planning Units*

Planning across scales is essential for EBM planning because it allows for the evaluation of the values at the regional, landscape, and stand levels. The outcome of this approach is the consistent application of management direction and zoning from strategic to operational planning. This approach has been used in developing forest management and land use plans in both the Yukon and northern Canada.

As mentioned, at the regional scale (1:250,000 - 1:500,000) the area has been classified into five planning units using ecoregions and major watersheds. Also within each plan unit, further ecological zoning has been applied using bioclimatic zones developed by the Yukon Department of Environment. The zones are based on climate and vegetation zones along an elevational gradient. The four zones are Alpine, Subalpine, Boreal Highland, and Boreal Lowland (Map 2). This allows for planning to consider management direction best suited to the bioclimatic zone. It also allows for targets and measures to be developed for each zone at the regional scale.

Landscape units within each plan unit allow for the assessment of values within each unit at a finer scale (1:50,000 – 1:100,000) and the development of zoning and management direction that could be unique for that unit.

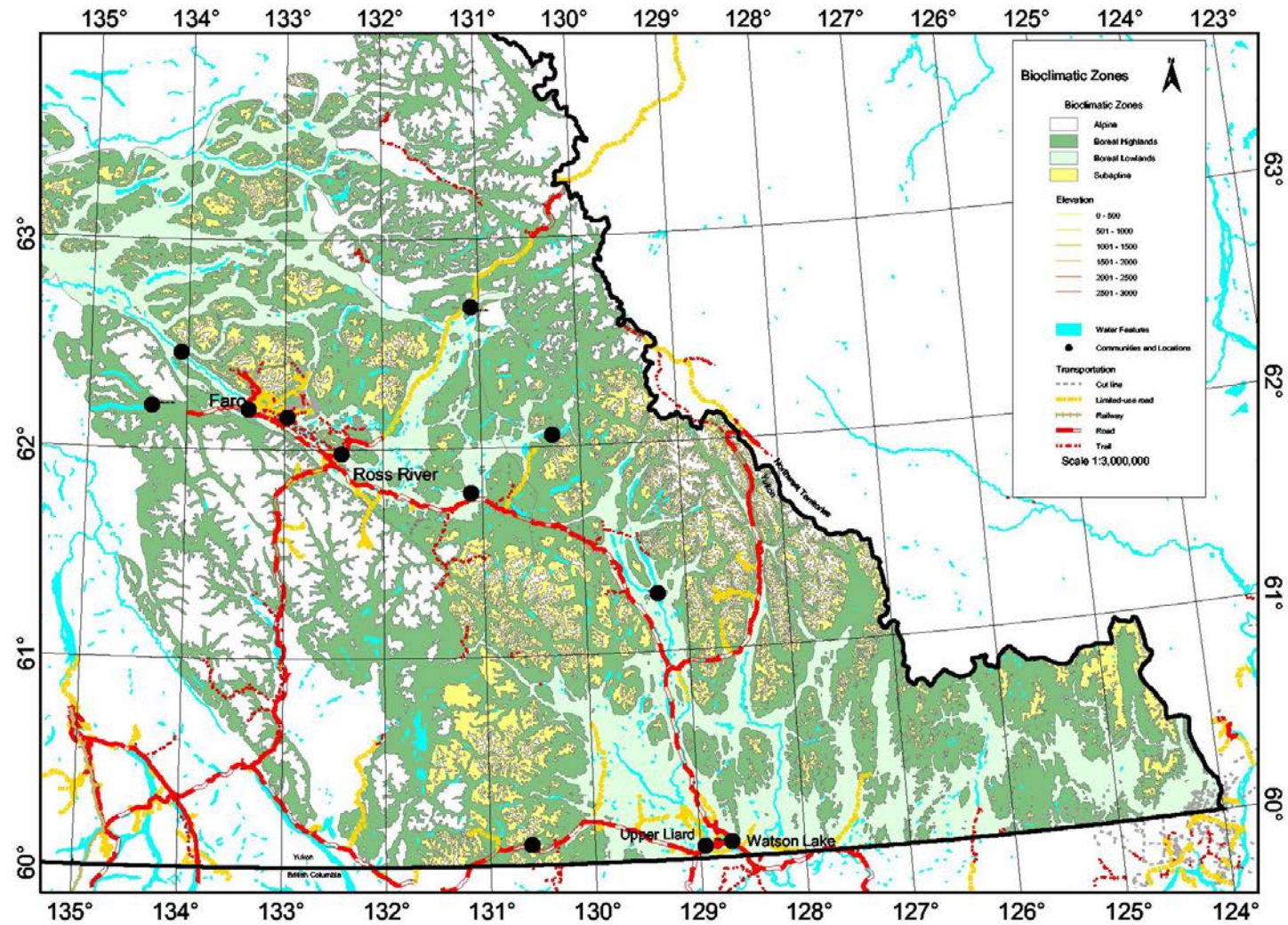


Figure 2. Bioclimatic zones in the plan area

Management practices will be recommended to be applied at the site or stand level such as wetland or riparian buffers, retention targets of old trees, or snags, or soil conservation techniques. By assessing the values at the regional, plan unit, and landscape unit scales, will allow for application of stand practices (1:20,000 – 1:50,000) that will be adjusted to meet the broad plan unit and landscape unit zones and management direction.

The KFRSC will apply planning across scales that will first look at the economic, cultural, social and ecological values at a broad scale and apply regional management zones and direction. Next within each plan unit values will be identified at a finer scale and further zoning and management direction developed that is consistent with the regional approach. The same approach will occur at the landscape unit scale and stand management practices applied that are consistent with the approach.

### **Zoning and Management Approach**

The zoning approach is very similar to land use and forest management plans being developed in the Yukon. Through the public identifying the values and assessing the trade offs, incremental zoning will be applied that will range from standard management practices that apply to the plan area, to spatially identified zones where specific management practices must be applied, and finally to zoning for deferred areas.

#### *Zone Definitions*

Deferred – permanent – The area is recommended for permanent removal from the Timber Harvesting Land Base (THLB).

Deferred – temporary – The area is recommended for temporary removal from the Timber Harvesting Land Base (THLB). Further information is required to consider forestry activities for the zone.

Area Specific Management – Management goals, objectives, and practices will identify integrated forest management activities specific to an area and its contribution to the THLB.

General Forest Management – This area is the primary component of the THLB where standard management goals, objectives, and practices for integrated forest management will be applied.

#### Forest Management Practices

Forest management practices will be adopted for all the above zones. Other resource sector development and planning should consider applying general management practices that will apply throughout the plan area.

Management goals, objectives, strategies, targets, and management practices will be developed for the following components:

- Biodiversity
- Wetlands
- Trappers/Guide Outfitters
- Recreation
- Tourism
- Lakes
- Water Quality
- Wildlife/Terrestrial Ecosystems
- Fish/Aquatic Ecosystems
- Kaska Cultural
- Timber
- Energy
- Minerals
- Access
- Silvicultural Strategies
- Agriculture
- Climate Change

Currently a review of Yukon forest management practices and guidelines is occurring by a third party. It is based on the KFRSC January 2004 recommendation to have the current forest management practices and guidelines reviewed and determine, after reviewing other jurisdictions, what practices are working, what need to be changed, and what information gaps need to be addressed through research.

However, since the work will not be completed until after these plans are completed, the KFRSC is using current management practices and where they are deficient, interim management practices will be developed.

### Plan wide Area Specific Management

There are a number of key values that are represented throughout the planning area that require special attention. These key features include large river corridors, wetlands, lakes, and cultural values.

#### *Large River Corridors*

Within each corridor it is expected that areas will be identified for ecological, cultural, and social values that could be deferred or have specific management direction. Also within this zone will be a different set of seral targets aimed at specific forest stands (e.g. alluvial spruce) and overall retention requirements will be different from forest stands outside the zone.

The size of each corridor will be dependent on the floodplain characteristics, wildlife and fish habitats, river headwaters, ecosystem representation, Kaska cultural-traditional uses, and timber.

#### *Wetlands and Lakes*

Wetlands have a large role in the boreal ecosystem and need to be managed across scales. In addition, wetlands have high cultural and social values that need to be

managed at various scales. Lakes have similar values as wetlands and will be managed in a similar fashion.

Wetlands and lakes will be classified, zoning applied, and it is likely that wetland and lake values will fall in all the management zone categories.

### *Cultural Values*

Kaska values, traditional areas, trails, and sites occur throughout the plan area and at several scales. Kaska values and areas will be identified across scales and zoning, management direction and practices will be developed. It is likely that cultural values will fall in all the management zone categories.

## **Values, Targets, and Measures**

In the 1990's, the Canadian Council of Forest Ministers (CCFM) began the process on how to define sustainable forest management in Canada (CCFM 1995). It was related to an international process called the Montreal Process, which was developing an assessment and monitoring process for sustainable forest management through Criteria and Indicators (C&I). The CCFM adopted the same approach to apply several criteria with broad measurable indicators that provides a national assessment framework to measure if sustainable forestry is being applied.

However, in reviewing the national C&I framework for the plan area it became a problem to scale the national indicators down to the regional scale. Another problem that became evident was the national indicators were geared to jurisdictions with a long history of timber harvesting and the C&I are not applicable to our situation. This is not unusual as the Canadian Model Forest Program recognized this situation and developed Local Level Indicators for their programs based on the CCFM criteria.

The KFRSC will apply the same approach as the Canadian Model Forest Program for the plan area. Values will be identified spatially for each plan and landscape unit, targets will be set to be maintained over time at the various scales, and measures or practices will be recommended to used for forest management in the southeast Yukon.

### *Cultural Values and Measures*

As identified in the MOU and the KFRSC Terms of Reference, Kaska Land Stewards need to be involved in the planning process and Kaska Traditional Knowledge (TK) has to be included as information to be considered in making balanced informed recommendations.

The Kaska Forest Resources Stewardship Council has supported the collection, management, and storage of Kaska Traditional Knowledge since 2003. The KFRSC developed contribution agreements with the Kaska Tribal Council, Liard First Nation,

Ross River Dena Council, Daylu Dena Council, and the Dease River First Nation and to a limited extent with the Kwadacha First Nation.

A Traditional Knowledge Protocol is being developed that will establish the Kaska own the information, secure intellectual property rights, and ensure proper use of the information and any products that are developed. Once The Kaska Leadership and the KFRSC have signed the protocol, then Kaska information can be included as a separate and equal layer of information with western science.

Each First Nation has completed an inventory of existing TK data, and then through Elder's and Kaska Land Stewards meetings local Traditional Knowledge Coordinator(s) and an Elder's Oversight Committee were selected. The coordinator works with the committee on information collection, review of plan materials, and reviews the application of the TK in forestry planning. Information has been collected through Elder's workshops and interviews with each First Nation responsible for the management and storage of the information.

Finally, the Elder's Oversight Committees are reviewing a Traditional Knowledge Manual. The manual will set the rules for the use of TK and identify the management practices for maintaining Kaska values.

### *Ecological Values and Measures*

It is a goal in EBM planning to maintain biodiversity over time and across scales. However, it is not possible to manage for each of the native species on the landscape. The approach of maintaining regional, landscape, and stand level features and ensuring their connectivity across scales is considered a suitable method to maintain biodiversity.

This has been done in other northern forest management plans by applying targets, measures, zoning, and management practices for

- Ecosystem representation
- Ecological benchmarks
- Focal species
- Special elements

The KFRSC will apply these techniques to the plan area and for the various planning scales.

### *Ecosystem Representation*

Ecosystem representation has in other northern forest and land use management plans been assessed through determining at the regional scale the percentage of ecosystems already within protected areas, areas deferred from forestry, or within special management zones. The KFRSC will report on the percentage of ecosystems (bioclimatic zones) by ecoregion in Special Management Areas, Order



in Council Lands, or other land designations in the plan area. This information will also be considered in reviewing the land base with the range of zoning and management tools.

In addition, forest age class distributions will be assessed within broad ecosystem zones and seral targets established (early, immature, mature, and old forests) for each zone. The seral targets will be used to ensure that over time and space those targets are maintained. If the targets are not met, then forestry activities will stop until the forests grow and age to meet the condition.

The seral targets identified in the Yukon Timber Harvest Planning and Operating Guidebook will be evaluated initially by bioclimatic zone for each planning unit. If the seral targets cannot be maintained through a forest rotation (using a spatial model), then seral targets will be developed based on the existing forest age class and the rate of change from natural disturbance.

At the landscape scale, the forest age class distribution, the forest type, and patch size will be identified. These criteria represent the “mosaic” of the forested landscape and targets will be set to maintain them over time and space. In addition, the distributions of merchantable and nonmerchantable forests will be assessed and depending on the distribution, targets based on forest type and age class will be set for both merchantable and nonmerchantable forests.

Depending on the mosaic of the landscape will result in stand level values being identified as being limited or having a high value. This will result in specific landscape or stand level measures or practices being applied.

Finally, stand level practices such as retention targets, buffers, or management zones will be developed to maintain features such as old forests, riparian features, or snags.

### **Natural Disturbance Patterns**

The KFRSC recognizes that logging cannot mimic wildfire or other disturbances in the boreal forest. However, there are practices that can strive to emulate the appropriate patch distribution, forest retention, stand structure, and provide seral stage targets based on disturbance regimes to minimize impacts within planning units.

Recent work on the historical natural disturbance regime in the southeast Yukon has identified fire as the main influence. Insects, forest diseases, and flooding occur but have small influence on the rate of change to forests regionally. It also indicates that fire suppression has not had an influence on the change of the forests over time. Finally, it indicated that the 80% of the fires were 0.1-100 ha, 8 % of the fires were 100-1000 ha, 8 % of the fires were 1000-10,000 ha, and 4% of the fires were >10,000 ha.

However, when considered against social values there are often conflicts on the degree of application of natural disturbance patterns. The KFRSC is reviewing recent literature, recent Yukon draft Strategic Forest Management Plans, management guidelines from other jurisdictions, and Model Forest information to evaluate the range of natural disturbance applications in consideration of social values.

### **Connectivity**

Another component of ecosystem representation is to maintain ecological diversity and function over time by connecting representative forest stands, wildlife habitats, and ecosystem features (such as wetlands, drainage systems, vegetation and habitat complexes, key wildlife habitat and movement corridors, etc.) across scales.

The resulting forest ecosystem network ensures that over time the original attributes of the ecosystem are maintained. For this plan, connectivity will be primarily maintained through connecting large river corridors, wetland and lakes zoning, focal species habitats, cultural zones, and ecological benchmarks at the regional and landscape scales.

Within each landscape and at the stand level, existing guidelines or interim practices will be recommended to maintain lowland to upland forest connections, wildlife corridors, block retention targets, or other practices.

Another component of maintaining connectivity is how forestry activities are applied on the landscape and the resulting pattern. The approach being considered by the KFRSC is a having a more concentrated timber harvest within a landscape unit that will minimize roads and maintain larger areas of contiguous forest cover, and interior forest conditions. Once the timber harvesting is completed then the operations are moved out of the area until the second growth forests have achieved suitable conditions. However this approach needs to be assessed against other forest uses and interests such as trapping, tourism, or Kaska Land Steward family areas to determine the best balance of timber harvesting disturbance within a landscape unit.

### ***Ecological Benchmarks***

The KFRSC has already applied the concept of ecological benchmarks in the Interim Wood Supply Plan area. An area of similar forest types and ages was identified to not allow timber harvesting for a set period, and the area could be used for monitoring as a control area.

A similar approach will be used in each plan unit and the area will include river valley to alpine ecosystems. Each benchmark area will be based on representing as much of the forest ecosystems, focal species habitats, and special elements as possible.

## *Focal Species*

Focal species have been used in planning as a way to provide a finer scale approach to maintaining biodiversity. It is assumed that by maintaining habitats for species such as a keystone species (removing a species from the ecosystem will impact ecosystem function e.g. snowshoe hares) or an umbrella species (one species habitats support a large number of other species) will assist in maintaining biodiversity.

Other criteria for focal species have included rare or endangered status, sensitivity to disturbance, or are culturally important.

The KFRSC used the following criteria in evaluating focal species:

1. **Human value, economic value, and cultural value**
2. **Species with high ecological value**
3. **Sensitivity to disturbance**
  - (a) Vulnerable to more access and harvest
  - (b) Habitat sensitivity
  - (c) Reproductively limited
  - (d) Direct sensitivity to disturbance
  - (e) Overall sensitivity
4. **Listed as At Risk (of extirpation)**
5. **Small populations or limited distribution**
6. **Population trend**
7. **Spatial scales**
8. **Role in planning**
  - (a) Habitats can be mapped and measured
  - (b) Species or guilds can be used as an indication of ecosystem change for monitoring (White tailed deer and Coyotes trends)
  - (c) Species or guilds can be used as a trigger for further management actions
9. **Adequacy of information**

All vertebrate species were considered, and some insects and forest health indicators were assessed. They represent the mammal, fish and amphibian classes of vertebrate animals. In addition, one insect, the boreal snaketail dragonfly, was included on a recommendation from Natureserve Yukon, along with three insects that may affect forest health at high numbers. Avian (bird) focal species were identified in a parallel process by biologists with the Canadian Wildlife Service.

The process was all species were reviewed using the above criteria and the following are considered as draft focal species for forest management planning in southeast Yukon. The Technical Working Group provided its recommendations to the Kaska Forest Resources Stewardship Council (KFRSC) this year.

- Woodland caribou
- Moose
- Thinhorn sheep
- Mountain goat
- White-tailed deer and Mule Deer

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- Grizzly bear
  - Fisher
  - American marten
  - Coyote
  - Northern flying squirrel
  - Hoary marmot
  - Arctic ground squirrel
  - Northern red-backed vole
  - Taiga vole
  - Snowshoe hare
  - Masked Shrew
  - Little brown bat
  - Bull trout
  - Lake trout
  - Northern pike
  - Arctic grayling
  - Western toad
  - Columbia spotted frog
  - Boreal snaketail dragonfly
  - Spruce bark beetle
  - Spruce budworm
  - Mountain pine beetle

Currently the following species will be reviewed as large river corridors, wetland and lakes zoning, access management, and stand practices are developed and may not be a final focal species because the other management tools will be sufficient to maintain the habitats:

- Masked Shrew
- Little brown bat
- Bull trout
- Lake trout
- Northern pike
- Arctic grayling
- Western toad
- Columbia spotted frog
- Boreal snaketail dragonfly
- Thinhorn sheep
- Mountain goat
- Hoary marmot
- Arctic ground squirrel

The following species are being considered to be used as monitoring indicators:

- White-tailed deer and Mule Deer
- Coyote
- Spruce bark beetle
- Spruce budworm
- Mountain pine beetle

The remaining species will be used for developing the regional plan and the following information is being collected to be used in developing zones, targets, measures, and practices:

- Regional status reports
- Habitat mapping
- Management tables to briefly identify key habitat features and possible management practices at planning scales

Avian species are being considered through the following methods

- A suite of resident species is being linked to forest mapping attributes and the mapping represents a surrogate of avian habitats. The habitat associations will have targets and measures to maintained over time

- Habitat mapping for the Northern goshawk and Boreal owl are being developed
- A suite of avian species is being developed for the Beaver Labiche area due to the different bird species and habitat associations in the area.

### ***Special Elements***

Special elements are small fine scale features that are known to be important but are not readily mapped. These include features such as rare plants and plant communities, wetlands such as string fens, fish spawning habitats, mineral licks, eskers, or marl lakes. If the areas are known or mapped then the information will be included in the developing zoning and management direction. However, management direction will be developed that as forestry activities occur that these features are identified and appropriate management practices applied.

### ***Economic Values and Measures***

#### ***Timber***

A merchantable stand of timber has been defined to be used for finished wood products. There has been no history of timber being use for pulp in the plan area, and it is not expected to occur over the next 10 years. A “sawlog” stand has been defined as having a 10 cm top, a volume of at least 150 cubic meters/hectare, and has a site index of medium or good. For each plan unit, further criteria will be developed to define merchantability considering slopes, soils and other features.

Currently, there is no forest industry in the plan area outside of small mill owners and local uses. To assist in considering the future forest economy the KFRSC hosted a community workshop in June 2005 in Watson Lake<sup>7</sup>. The workshop provided the community opportunity to provide their expectations for the future forest economy.

Recently the Watson Lake Chamber of Commerce has released a forest market analysis for the southeast Yukon by Price Waterhouse. In addition, the Yukon Department of Economic Development provided an action plan for the timber industry and an updated timber analysis. All the information will be considered by the KFRSC for economic values and interests. .

#### ***Mineral***

The Yukon Department of Energy, Mines, and Resources has provided the following information for considering mineral potential and development in regards to forestry activities:

- Quartz and Placer claims<sup>8</sup>

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<sup>7</sup> see <http://www.kfrsc.ca/6Publicworkshops.html>

<sup>8</sup> see <http://www.yukonminingrecorder.ca/>

- Coal leases
- Past producers and operating mines
- Mineral potential mapping
- Seismic lines and mine infrastructure

### ***Trapping and Guide Outfitting***

The Yukon Department of Environment has provided the following information for considering trapping and guide outfitting concerning forestry activities:

Harvest data  
Trapping and Guide Outfitters Concessions <sup>9</sup>

In addition, the KFRSC has been providing the opportunity for local trappers and guide outfitters to review information, and consider providing information about their area. Any information provided is considered confidential.

### ***Energy***

The Yukon Department of Energy, Mines, and Resources has provided the following information for considering energy potential and development in regards to forestry activities:

- Oil and Gas basins<sup>10</sup>
- Oil and Gas dispositions
- Nomination areas
- Seismic lines and Oil and Gas infrastructure
- Alaska Highway Natural Gas pipeline proposed route

### ***Tourism***

The Yukon Department of Tourism and Culture will be providing Tourism Information Mapping. The information identifies tourism opportunities in a spatial format that can be used in evaluating forest uses and management practices.

### ***Agriculture and Lands***

The Yukon Department of Energy, Mines, and Resources has provided the following information for considering agriculture and lands development in regards to forestry activities:

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<sup>9</sup> see [http://geomaticsyukon.ca/data\\_download.html](http://geomaticsyukon.ca/data_download.html)

<sup>10</sup> see <http://www.emr.gov.yk.ca/oilandgas>

- Agriculture and Lands dispositions
- Agriculture and Lands applications and leases

### *Social Values and Measures*

#### ***Community Forest Uses***

Through the public participation process, it is hoped that information on forest uses near communities can be identified. There has been some interest in developing community forest models that provide the communities working with government to identify areas of other forest uses, areas for fire management (e.g. lowering the fuel loads near communities), and areas for local timber harvesting.

#### ***Recreation***

Through the public participation process, it is hoped that information on recreation uses near communities can be identified. Trails, campgrounds, and other recreations features will be identified and used in developing zones and management direction.

#### ***Visual Quality***

Visual quality objectives will be established on specific features such as lakes, rivers, highways to ensure forestry activities do not affect other forest uses such as front country tourism, camping, or river rafting.

### **Regional Forest Management Plan Model**

The regional and subregional plans will use a value and interests zoning model that uses ecological, cultural, social, and economic trade off assessments to assist in the KFRSC providing recommendations.

The process is in three stages, with the first stage completing the following requirements:

- Establishing planning units
- Compile a plan atlas of existing information
- Overlaying of values
- Develop zoning and management direction across planning scales
- Development of a range of forest use options with public and community input for trade off analysis

The second stage is to assess the different forest use options and management strategies. The options will be evaluated through community and public input on the degree of acceptable trade offs for forestry activities.

The final stage is developing consensus agreement on a final forest management option.

#### *Atlas- Defining the land base*

A plan atlas will be developed and housed in one government department, and it will require a commitment for personnel to maintain it. All spatial data will use the Yukon Government's standards and projections. A copy of the atlas and dictionary will be available for the KFRSC, the Kaska, and the public.

Information is not limited to only publicly available data, but information developed from previous processes such as Land Claims, or previous forest management planning need to be included. In addition, public interest groups will provide information to the council, and the KFRSC may recommend the information be included in the atlas.

#### *Overlays of values and Interests*

Once information has been collected, the KFRSC will begin overlaying all values and interests. The intent is not to provide management solutions, but to begin identifying the scope of values and their relative importance across planning scales. Values and interests will include other resource sectors and human activities. The outcomes will be the creation of zones. Multiple zones can occur at this point and some zones will cross several planning units. Once all the zones and values are identified, discussion will occur on the type of management required to maintain the values.

Community and public input will occur during this phase to direct the KFRSC in refining the range of options. However to assist in commencing community input to the plan, the KFRSC will provide draft zoning and management options for public review.

#### *Evaluating Options*

The KFRSC will develop several management options to assess impacts to the cultural, social, economic, and ecological values based on community and public direction. For each management option and zone, management targets and measures will be developed. A spatial model (Woodstock Stanley) will test if the initial set of criteria can be maintained through a forest rotation. If it cannot be achieved then the criteria will be adjusted until it can be maintained through the rotation period. The KFRSC will then bring all the information to the community and public for review and further direction. The direction will provide the range of acceptable trade offs for a final forest management option.



### *Recommend Option*

After public input has been incorporated into the draft trade offs assessments, the KFRSC will begin the process of moving from several options to one suite of management directions. Using interest based negotiations and the principle of consensus decision-making, the KFRSC will evaluate the trade offs to work towards agreement to a draft final forest management option. The period will be an interactive process with the Technical Working Group, communities, public interest groups, and public working with the KFRSC towards a final draft forest management plan.

Once the KFRSC has agreed to a draft final forest management option, a draft Regional Forest Management Plan will be presented for public review. The plan would detail the consensus agreements, zones, management assumptions, and assessment results. After a review period, public input will be incorporated and the KFRSC will provide consensus recommendations to the Parties of the MOU.

### **Adaptive Management and Monitoring Strategies**

The MOU indicates the need to provide monitoring strategies for values, identify information gaps, and provide a process to incorporate new information in a timely manner (adaptive management).

As the plan area is zoned and management direction set through community direction, monitoring strategies will presented for the range of values that can be:

- monitored by the communities and available to the public;
- are cost effective; and
- as the plan is updated every 5 and 10 years, management direction can be assessed for its effectiveness.

### **Management Options**

Each Plan Unit was reviewed for values and interests at a broad scale, and a number of management scenarios considered for each Landscape Unit. For each Landscape Unit, further detailed planning will occur using ecosystem-based planning principles and will evaluate the degree of trade offs associated with each management option. The planning results, proposed management practices, and recognized trade-offs will be brought back to the communities and public to review.

(Please see [www.kfrsc.ca](http://www.kfrsc.ca) for detailed maps of the planning units and management options)

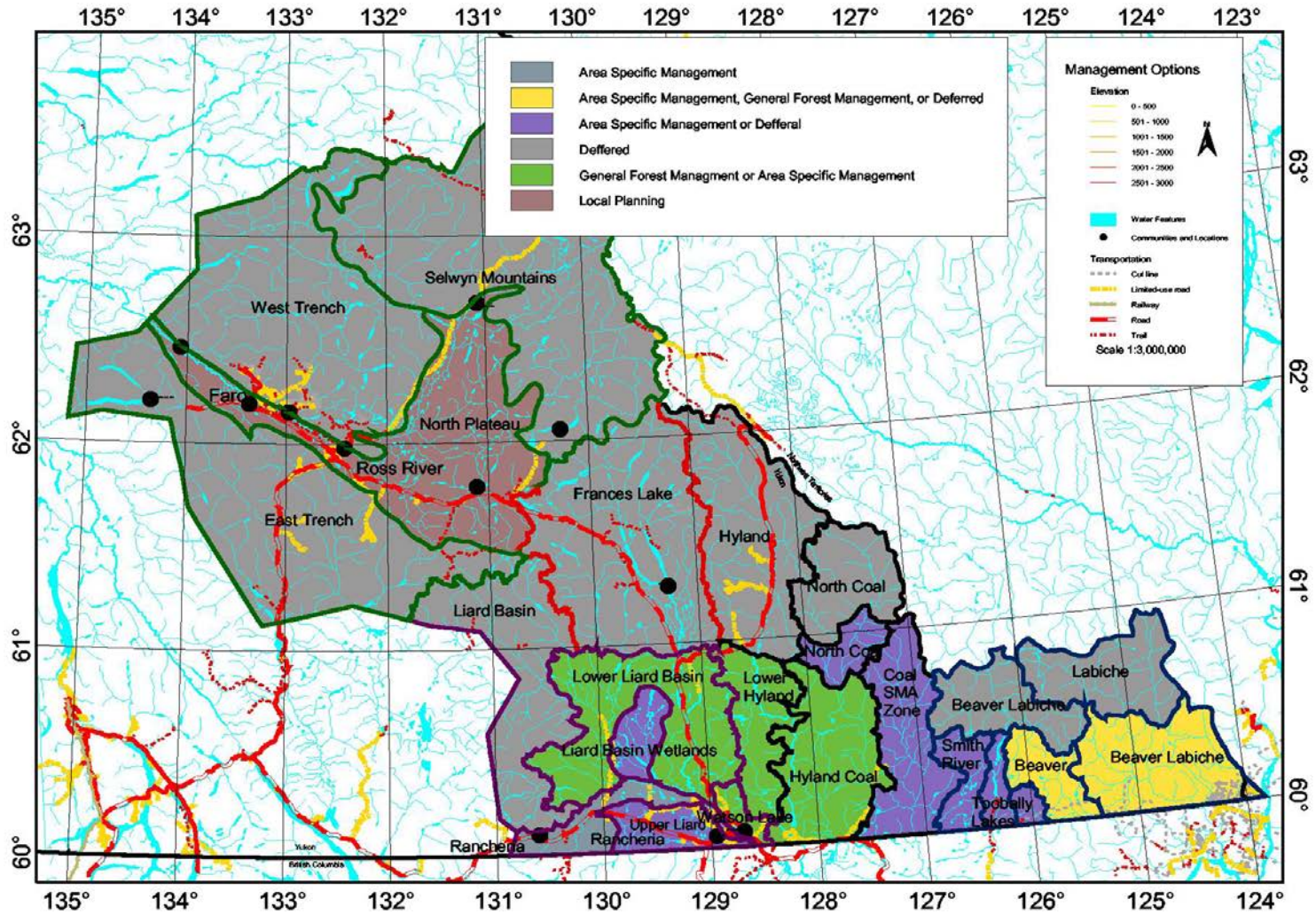


Figure 3. Draft regional management options

## East Planning Unit

### Deferred Areas

Upper Beaver and Labiche Landscape Units

### Area Specific Management or Deferral

Smith River and Toobally Lakes Landscape Units

### General Forest Management, Area Specific Management, or Deferral

Beaver Landscape Unit

Beaver Labiche Landscape Unit

## Central Planning Unit -

### Deferred Areas

Hyland Landscape and North Coal (northern portion) Landscape Units

### Area Specific Management or Deferral

Coal SMA and North Coal (southern portion) Landscape Units

### General Forest Management or Area Specific Management

Hyland Coal and Lower Coal Landscape Units

## West Plan Unit

### Deferred Areas

Upper Liard Basin

Shared areas with Teslin Tlingit Council

### Area Specific Management or Deferral

Rancheria Landscape Unit

### General Forest Management or Area Specific Management

Lower Liard Basin, Lower Liard Wetlands, and Watson Lake Landscape Units

### Frances Lake Plan Unit

The whole area is considered deferred with only small volume timber permits (<1000 cubic meters) being allowed for building logs or timber for cabins. It is expected logging to use small openings and visual quality to be managed by Yukon Forest Management Branch.

Management direction for this plan unit will need to identify and set practices for access, wildlife, aquatic ecosystems, traditional uses/sites, and mineral development.

### North Plan Unit

The Kaska Forest Resources Stewardship Council recognizes that the scale of forestry activities in this plan unit will be small, localized, and will be taking advantage of specific needs (e.g. building logs, timber for mines). The planning for the unit will have communities identify areas to avoid due to cultural, ecological or community values. Then as timber opportunities arise, Yukon Forest Management Branch working with the northern plan communities can place operators outside of these areas.

Some salvage operations may occur due to the number of fires in the area, possible timber from construction of mining roads, and community interest in small-scale bioenergy technologies

Management direction for this plan unit will need to identify and set practices for access, wildlife, salmon/aquatic ecosystems, traditional uses/sites, and mineral development.

### ***Policy and legislation***

The KFRSC is responsible for recommending policy and legislative changes for the plan area. Through community and public input a number of policy and legislative issues will become known. In addition, the KFRSC is interested in providing policy recommendations to government that can assist in future planning processes with participating government agencies.

### ***Subregional Plans***

The KFRSC is responsible for developing sub-regional plans as identified in the MOU and Terms of Reference. Plans are required for the Rancheria and Garden Creek planning units. Draft subregional plans will be developed in a similar manner as the Regional Forest Management Plan and will be provided no later than February 2006 for public review. If the draft plans are available sooner, the KFRSC may submit them for public review before the regional forest plan is completed.

The Technical Working group will also provide technical support for each subregional plan.

## Definitions

The following definitions were developed by the United States Federal Forest Service to provide clear and simple language definitions for ecosystem-based forest management planning<sup>11</sup> (see <http://www.fs.fed.us/land/emterms.html>). The complete list can be provided, but only definitions related to the planning are listed. The list is considered draft and will be updated as planning advances.

**adaptive management-** A type of natural resource management that implies making decisions as part of an on-going process. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

**age class-** An age grouping of trees according to an interval of years, usually 20 years. A single age class would have trees that are within 20 years of the same age, such as 1-20 years or 21-40 years.

**biological diversity-** The number and abundance of species found within a common environment. This includes the variety of genes, species, ecosystems, and the ecological processes that connect everything in a common environment.

**biome-** The complex of living communities maintained by the climate of a region and characterized by a distinctive type of vegetation. Example of biomes in North America include the tundra, desert, prairie, and the western coniferous forests.

**biota-** The plant and animal life of a particular region.

**biotic-** Living. Green plants and soil microorganisms are biotic components of ecosystems.

**buffer-** A land area that is designated to block or absorb unwanted impacts to the area beyond the buffer. Buffer strips along a trail could block views that may be undesirable. Buffers may be set aside next to wildlife habitat to reduce abrupt change to the habitat.

**canopy-** The part of any stand of trees represented by the tree crowns. It usually refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

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<sup>11</sup> (see <http://www.fs.fed.us/land/emterms.html>)

**cavity-** A hole in a tree often used by wildlife species, usually birds, for nesting, roosting, and reproduction.

**clear cut-** A harvest in which all or almost all of the trees are removed in one cutting.

**climax-** The culminating stage in plant succession for a given site. Climax vegetation is stable, self-maintaining, and self-reproducing.

**coarse filter management-** Land management that addresses the needs of all associated species, communities, environments, and ecological processes in a land area. (See fine filter management.)

**composition-** What an ecosystem is composed of. Composition could include water, minerals, trees, snags, wildlife, soil, microorganisms, and certain plant species,

**conifer-** A tree that produces cones, such as a pine, spruce, or fir tree.

**connectivity (of habitats)-** The linkage of similar but separated vegetation stands by patches, corridors, or "stepping stones" of like vegetation. This term can also refer to the degree to which similar habitats are linked.

**corridor-** Elements of the landscape that connect similar areas. Streamside vegetation may create a corridor of willows and hardwoods between meadows where wildlife feed.

**cover-** Any feature that conceals wildlife or fish. Cover may be dead or live vegetation, boulders, or undercut streambanks. Animals use cover to escape from predators, rest, or feed.

**desired future condition-** Land or resource conditions that are expected to result if goals and objectives are fully achieved.

**ecological approach-** An approach to natural resource management that considers the relationships among all organisms, including humans, and their environment.

**ecology-** The interrelationships of living things to one another and to their environment, or the study of these interrelationships.

**ecoregion-** An area over which the climate is sufficiently uniform to permit development of similar ecosystems on sites that have similar properties. Ecoregions contain many landscapes with different spatial patterns of ecosystems.

**ecosystem-** An arrangement of living and non-living things and the forces that move among them. Living things include plants and animals. Non-living parts of

ecosystems may be rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

**ecosystem management-** An ecological approach to natural resource management to assure productive, healthy ecosystems by blending social, economic, physical, and biological needs and values

**ecotone-** The transition zone between two biotic communities, such as between the Ponderosa pine forest type and the mixed conifer forest, which is found at higher elevations than the pine.

**ecotype-** A population of a species in a given ecosystem that is adapted to a particular set of environmental conditions.

**edge-** The margin where two or more vegetation patches meet, such as a meadow opening next to a mature forest stand, or a ponderosa pine stand next to an aspen stand.

**endangered species-** A plant or animal that is in danger of extinction throughout all or a significant portion of its range.

**even aged management-** Timber management actions that result in the creation of stands of trees in which the trees are essentially the same age.

**fine filter management-** Management that focuses on the welfare of a single or only a few species rather than the broader habitat or ecosystem. (See coarse filter management.)

**fire cycle-** The average time between fires in a given area.

**fire regime-** The characteristics of fire in a given ecosystem, such as the frequency, predictability, intensity, and seasonality of fire.

**fisheries habitat-** Streams, lakes, and reservoirs that support fish, or have the potential to support fish.

**flood plain-** A lowland adjoining a watercourse. At a minimum, the area is subject to a 1% or greater chance of flooding in a given year.

**GIS (geographic information systems)-** GIS is both a database designed to handle geographic data as well as a set of computer operations that can be used to analyze the data. In a sense, GIS can be thought of as a higher order map.

**group selection-** A method of tree harvest in which trees are removed periodically in small groups. This silvicultural treatment results in small openings that form mosaics of age class groups in the forest.

**habitat-** The area where a plant or animal lives and grows under natural conditions.

**habitat capability-** The ability of a land area or plant community to support a given species of wildlife.

**habitat diversity-** A number of different types of wildlife habitat within a given area.

**habitat type-** A way to classify land area . A habitat type can support certain climax vegetation, both tree and undergrowth species. Habitat typing can indicate the biological potential of a site.

**individual tree selection-** The removal of individual trees from certain size and age classes over an entire stand area. Regeneration is mainly natural, and an uneven aged stand is maintained.

**old growth-** Old forests often containing several canopy layers, variety in tree sizes and species, decadent old trees, and standing and dead woody material.

**patch-** An area of homogeneous vegetation, in structure and composition.

**patch cut-** A clearcut that creates small openings in a stand of trees.

**range of variability (Also called the historic range of variability or natural range of variation.)-** The components of healthy ecosystems fluctuate over time. The range of sustainable conditions in an ecosystem is determined by time, processes (such as fire), native species, and the land itself. For instance, ecosystems that have a 10 year fire cycle have a narrower range of variation than ecosystems with 200-300 year fire cycle. Past management has placed some ecosystems outside their range of variability. Future management should move such ecosystems back toward their natural, sustainable range of variation.

**reforestation-** The restocking of an area with forest trees, by either natural or artificial means, such as planting.

**residual stand-** The trees remaining standing after an event such as selection cutting.

**resilience-** The ability of an ecosystem to maintain diversity, integrity, and ecological processes following a disturbance.

**second growth-** Forest growth that was established after some kind of interference with the previous forest crop, such as cutting, fire, or insect attack.

**sensitive species-** Plant or animal species which are susceptible to habitat changes or impacts from activities.



**seral-** The stage of succession of a plant or animal community that is transitional. If left alone, the seral stage will give way to another plant or animal community that represents a further stage of succession.

**shelterwood-** A cutting method used in a more or less mature stand, designed to establish a new crop under the protection of the old.

**silvicultural system-** The cultivation of forests; the result is a forest of a distinct form. Silvicultural systems are classified according to harvest and regeneration methods and the type of forest that results.

**structure-** How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, or mosaic, or total randomness of vegetation.

**suitability-** The appropriateness of certain resource management to an area of land. Suitability can be determined by environmental and economic analysis of management practices.

**sustainability-** The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

**sustainable-** The yield of a natural resource that can be produced continually at a given intensity of management is said to be sustainable.

**sustained yield-** The yield that a renewable resource can produce continuously at a given intensity of management.

**threatened species-** Those plant or animal species likely to become endangered throughout all or a specific portion of their range within the foreseeable future.

**uneven-aged management** - Actions that maintain a forest or stand of trees composed of intermingling trees that differ markedly in age. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

**viable population-** The number of individuals of a species sufficient to ensure the long-term existence of the species in natural, self-sustaining populations that are adequately distributed throughout their range.

**visual quality objective-** A set of measurable goals for the management of forest visual resources.

**watershed-** The entire region drained by a waterway (or into a lake or reservoir). More specifically, a watershed is an area of land above a given point on a stream that contributes water to the streamflow at that point.

**wetlands-** Areas that are permanently wet or are intermittently covered with water.

**windthrow-** Trees uprooted by wind.